

Research Program

FFY 2022 AT-A-GLANCE

(October 1, 2021 - September 30, 2022)

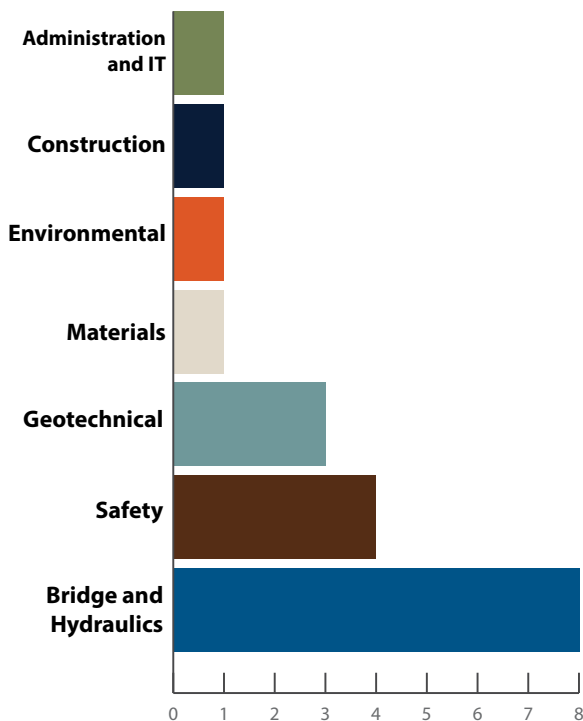
The guiding mission of the Montana Department of Transportation (MDT) is to plan, build, operate, and maintain a safe and resilient transportation infrastructure to move Montana forward.

All research actions directly enhance MDT's ability to meet its mission and to deliver efficient and effective transportation services.

Research by the Numbers

To view the MDT Research Program Annual Reports, please visit the MDT website at https://www.mdt.mt.gov/research/annual_report.aspx

NUMBER OF PROJECTS BY TOPIC



RESEARCH PROJECTS

19	5	4	10	39
Active research contracts	Research reports	Number of new research projects in 2022	MDT-supported pooled fund studies	Active Technical Panel members

EXPERIMENTAL PROJECTS

24	3
Active experimental projects	Number of new experimental projects in 2022

LIBRARY

753	1,027	1,618
Unique library catalog visits	Unique library catalog searches	Unique library catalog searches

MDT Library

MDT's Library is managed in the Research Program Section. The library supports MDT information needs, including technology transfer of completed research projects. Within the library, MDT maintains a physical and digital library collection and on-demand reference services. The MDT librarian is Kaia Rosen.

Library Collection Analysis by Item Type

Item Type	Number of Items
Book	19,874
CD	352
Digital	8,392
DVD	249
Journal	1,150
OverDrive	479
TOTAL	30,496

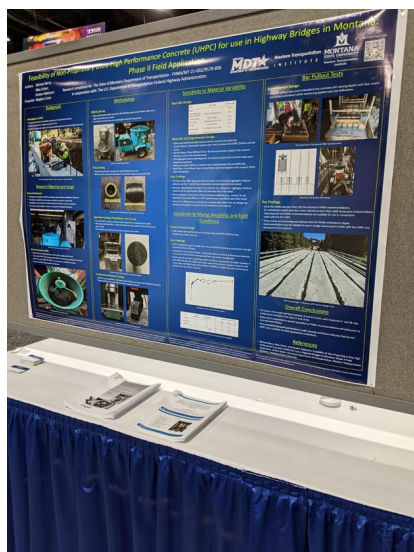
Library Circulation by Item Type

Item Type	Total Circulation
Book	143
CD/DVD	5
Interlibrary Loan Borrowed	22
Interlibrary Loan Lent	11
OverDrive Audio & E-Books	292
TOTAL	473

Digital resources are not included in the circulation statistics. Please see the first page for the number of users accessing the library digitally.

Research Projects

MDT uses research funds for individual research projects and annual programs, which include Transportation Pooled Funds (TPF) and several AASHTO Technical Service Programs (TSP). Research funding is also used for TRB Core Services and NCHRP.



High Value Research— Supplemental Topic Award

A Feasibility Study of Road Culvert Bridge Deck Deicing Using Geothermal Energy

Each year, the AASHTO Research Advisory Committee holds a competition to highlight high value research (HVR). All 50 states, DC, and Puerto Rico are encouraged to submit HVR entries. In 2022, MDT was recognized through a Supplemental Topic award. The award allowed MDT to showcase the research project at the 2023 Annual TRB meeting in Washington, DC. Megan Coon represented MDT on behalf of its Bridge Bureau and presented a poster at annual TRB meeting in January 2023.

For more information about MDT's HVR achievements over the years, please visit our website at mdt.mt.gov/research/high-value-research.aspx.

Bridge and Hydraulics Research Projects

Project Number	Title	Consultant	Start Date	End Date	Programmed Cost
9630-700	Concrete-Filled Steel Tube to Concrete Pile Cap Connections: Further Evaluation/Improvement of Analysis/Design Methodologies (Phase IV-V)	Montana State University	7/10/2018	3/31/2024	\$241,000
9831-765	Development of Deterioration Curves for Bridge Elements in Montana	Montana State University	8/5/2019	12/31/2022	\$83,000
9757-705	Evaluation of Thin Polymer Overlays for Bridge Decks	Wiss, Janney, Elstner and Associates	1/22/2020	3/31/2023	\$95,000
10000-844	Exploration of UHPC Applications for Montana Bridges	Montana State University	8/1/2021	10/31/2023	\$178,000
9925-818	Feasibility of Non-Proprietary Ultra-High Performance Concrete (UHPC) for Use in Highway Bridges in Montana: Implementation	Montana State University	12/10/2020	4/30/2023	\$114,000
9890-784	A Feasibility Study of Road Culvert Bridge Deck Deicing Using Geothermal Energy	Montana State University	7/13/2020	12/31/2023	\$235,000
9696-700	Bridge Deck Cracking Evaluation	Wiss, Janney, Elstner and Associates	8/6/2019	1/31/2022	\$225,686 (final cost)
9790-727	Monitoring Streamflow Using Video Cameras	United States Geological Survey	8/5/2019	1/31/2022	\$153,600
10336-933	Significant Factors of Bridge Deterioration	TBD	TBD	TBD	\$109,280
9353-511	Use of Fiber-Reinforced Polymer Composites for Bridge Repairs in Montana	TBD	TBD	TBD	\$287,907

Construction Research Projects

Project Number	Title	Consultant	Start Date	End Date	Programmed Cost
9929-819	Artificial Intelligence (AI) based Tool to Estimate Contract Time	Texas Transportation Institute	8/4/2021	5/31/2023	\$145,000

Environmental Research Projects

Project Number	Title	Consultant	Start Date	End Date	Programmed Cost
9923-808	Effective Wildlife Fences Through Better Functioning Barriers at Access Roads and Jump-Outs	Montana State University	12/20/2020	8/31/2023	\$67,000
5896-423	MDT Wildlife Accomodation Process	N/A	2/14/2019	10/31/2024	\$0
9596-617	Testing Wildlife-Friendly Fencing Modifications to Manage Wildlife and Livestock Movements	N/A	7/19/2021	1/31/2023	\$0
10325-900	Evaluate MDT Electrified Wildlife Deterrent Mats	TBD	TBD	TBD	\$449,550
TBD	Renewable Energy Generation within MDT Right of Way (ROW)	TBD	TBD	TBD	\$110,000

STATUS KEY: Active Completed Implementation Proposed

Geotechnical Research Projects

Project Number	Title	Consultant	Start Date	End Date	Programmed Cost
10119-878	Development of P-Y Curves for Analysis of Laterally Loaded Piles in Montana	Montana State University	4/27/2022	11/30/2026	\$270,000
10118-877	Organization and Analysis of Measurement While Drilling (MWD) Data	Montana Technological University	8/31/2022	10/31/2024	\$116,000

Information Services Research Projects

Project Number	Title	Consultant	Start Date	End Date	Programmed Cost
9922-807	Analyze Business Models for Implementation and Operation of a Statewide GNSS Real-Time Network	Montana State University	2/12/2020	1/31/2023	\$84,000
TBD	Implementation of Electric Vehicle Charging Infrastructure and Its Economic Benefits in Small Urban and Rural Communities	N/A	TBD	TBD	\$166,500

Materials/Data Collection & Analysis Research Projects

Project Number	Title	Consultant	Start Date	End Date	Programmed Cost
9577-607	Alkali-Silica Reactivity in the State of Montana	Montana State University	4/6/2018	11/30/2021	\$73,386 (final cost)
9921-806	Numerical Modeling of the Test Pit for Falling Weight Deflectometer Calibration	Montana State University	11/19/2020	2/28/2022	\$25,990 (final cost)

Safety Research Projects

Project Number		Title	Consultant	Start Date	End Date	Programmed Cost
9832-766		Effectiveness of Highway Safety Public Education at Montana Motor Vehicle Registration Stations by Streaming a Variety of Safety Content	Montana State University	3/15/2020	4/30/2023	\$166,000
9932-820		Safety Evaluation of Sinusoidal Centerline Rumble Strips	Pennsylvania State University	1/19/2022	7/10/2026	\$207,000
8882-444		Traffic Safety Culture Transportation Pooled Fund (TSC-TPF) Program – Phase 2	Montana State University	10/1/2019	9/30/2024	\$952,000
POOLED FUND 8882-444 SUBPROJECTS	8882-444-20	Resources and Tools to Reduce Multi-Risk Driving Behaviors	Montana State University	3/2021	3/2024	\$236,024
	8882-444-21	FFY 2021 Management Support Contract	Montana State University	10/2019	9/2024	\$22,979
	8882-444-22	Resources and Tools to Reduce Multi-Risk Driving Behaviors	Montana State University	5/2022	4/2025	\$268,140
	8882-444-23	Understanding Aggressive Driving and Ways to Reduce It - Phase 1	Montana State University	7/2022	4/2024	\$132,638
	8882-444-19	A Review of Methods to Change Beliefs	Montana State University	3/2021	5/2022	\$74,128
9679-699		Developing a Methodology for Implementing Safety Improvements on Low-Volume Roads in Montana	Montana State University	2/15/2016	11/30/2021	\$70,016 (final cost)
9891-785		Icy Road Forecast and Alert (IcyRoad): Validation and Refinement Using MDT RWIS Data	University of Montana	7/13/2020	5/31/2022	\$81,699 (final cost)

STATUS KEY:

Active

Completed

Proposed

Annual Programs

Title	FFY 2022 Cost
LOCAL TECHNICAL ASSISTANCE PROGRAM	
Montana Local Technical Assistance Program (LTAP)	\$380,000
TRANSPORTATION RESEARCH BOARD SUPPORT	
NCHRP	\$281,132
TRB Core Services Support	\$124,928
AASHTO TECHNICAL SERVICE PROGRAMS	
AASHTO Innovation Initiative	\$6,000
AASHTO re:source (formerly AMRL)	\$26,500
Development of AASHTO Materials Standards	\$10,000
Equipment Management Technical Services Program	\$5,000
Load and Resistance Factor Design Bridges and Structures Specification Maintenance	\$15,000
National Transportation Product Evaluation Program, includes AASHTO Product Evaluation List (APEL)	\$20,000
Transportation System Preservation Technical Services Program	\$20,000
Total Technical Service Program Cost (total includes Indirect Costs):	\$114,000

Transportation Pooled Fund Studies

Title	FFY 2022 Cost
Building Information Modeling (BIM) for Infrastructure - TPF-5(480)	\$30,000
Clear Roads Phase II - TPF-5(353)	\$25,000
Improve Pavement Surface Distress and Transverse Profile Data Collection and Analysis, Phase II - TPF-5(399)	\$15,000
Northwest Passage Phase #4 - TPF-5(376)	\$25,000
Pavement Structural Evaluation with Traffic Speed Deflection Devices (TSDDs) - TPF-5(385)	\$45,000
Technology Transfer Concrete Consortium (FY20-FY24) - TPF-5(437)	\$12,000
Traffic Control Device (TCD) Consortium (3) - TPF-5(447)	\$10,000
Traffic Safety Culture: Phase 2 - TPF-5(309)/(444)	\$25,000
Updating U.S. Precipitation Frequency Estimates for the Northwest - TPF-5(454)	\$133,520
Western Alliance for Quality Transportation Construction (WAQTC) - 2021-2025 TPF-5(476)	\$12,000
Western Maintenance Partnership – Phase 3 - TPF-5(394)	\$5,000

STATUS KEY: Active

Experimental Features Program

All Experimental Projects are managed by Chad DeAustin.

MDT uses Experimental Features to encourage innovation in highway design and construction. The incorporation of experimental features allows for a vital field evaluation of new materials, processes, and methods for determining the implementation value based on constructibility, cost-effectiveness, and performance. The features are monitored after construction to determine performance and durability.

The “End Date” shown in the table reflects the duration of monitoring post-construction. Each experimental feature has its own webpage where reports can be found.

Project Number	Experimental Project Number	Title	Experimental Feature	Construction Year	End Date
IM 90-1(205)59[8189]	MT-13-14	I-90 Nemote Creek Culvert	Spraywall Culvert Rehabilitation	2017	2022
NH 12-1(20)0[8762]	MT-15-01	Targhee Pass - West Yellowstone	Fog Seal over Chip Seal Comparison	2017	2022
UPP 5201(24)[8978]	MT-17-03	Smelter - 1st to 5th NW	Asphalt Paving Geofabric	2017	2022
NH1-1(10)0[8956]	MT-17-04	Jct 508 - East & West	Centerline Rumble Strips	2017	2022
IM 15-5(124)282[7621]	MT-17-05	Emerson Junction - Manchester	3/8" Plant Mix Surfacing	2017	2022
IM 90-1(220)6[8954]	MT-18-01	Exit 5 - East	Fog Seal over Chip Seal Comparison	2017	2022
UPN 9370	MT-18-02	Sinusoidal CLRS - Colstrip	Sinusoidal Centerline Rumble Strips	2018	2023
UPPIP 1017(2)7[9003]	MT-18-03	Division St - Billings	Asphalt Paving Fiber	2018	2023
STPP 17-1(10)11[5157]	MT-18-05	Milk River - North	Base One Soil Stabilization	2018	2023
STPP 6-1(155)99[9239]	MT-19-02	Dixon - West & Dixon - Ravalli	Chip Seal Emulsion Comparison	2019	2024
STPP 96-1-55-10[8112]	MT-19-05	Bridger Canyon	Jointbond Joint Stabilizer	2019	2024
STPP 6-1(123)57[4039]	MT-20-01	East of Thompson River - East	Electrified Wildlife Deterrent Mats	2019	2024
NHIP NHPBIP 8-4(66)86[7668]	MT-20-01	Toston Structures	Electrified Wildlife Deterrent Mats	2021	2026
NH 1-6(123)355[9393]	MT-20-02	Gildford - East	Chip Seal Comparison	2020	2025
ER 35(21)[9745]	MT-20-03	Valentine Road	Flexamat Erosion Control	2020	2025
STPS 218-1(11)0[9401]	MT-20-04	Conrad - East	Crafco Mastic One	2020	2025
NHIP 20-2(32)62[8168]	MT-20-05	MT 200 - Fairview	PCCP Bondbreaker	2020	2025
STPP 83-1(40)32[9500]	MT-20-06	Condon - North & South	Void Reducing Asphalt Membrane	2020	2025
NH 8-4(79)68[9470]	MT-21-02	Townsend - North	Diamond Grind Road Smoothing	2021	2026
STPS 313-1(17)1[5793]	MT-21-03	Hardin - South	Geogrid Soil Stabilization	2022	2027
IM 94-6(59)193[8150]	MT-21-04	Bad Route Interchange NE	Aggregate Slope Evaluation	2021	2026
HSIP-NH-1-2(193)118[8626]	MT-21-05	SF 139 - Dern/Spring Cr Reconstruct	Polymer Overlay on PCCP	2022	2027
STPP 86-1(27)0[4805]	MT-21-06	Rouse Ave - Main to Oak	Nomaflex Concrete Joint Filler	2021	2026
NH 5-3(154)115[9862]	MT-22-02	Grandview Dr - Reserve Dr	Asphalt Paving Fiber	2022	2027

STATUS KEY: Active



MONTANA

Department of Transportation

Research

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